

THE CLAIMS

1. An integrated circuit comprising a regulated power supply including a pyroelectric capacitor.
2. The integrated circuit of claim 1, further comprising a heater, thermally coupled to the capacitor, and a circuit for causing the heater to apply heat pulses to the pyroelectric capacitor.
3. The integrated circuit of claim 2, wherein the heater includes a thin film dissipating element on a plate of the pyroelectric capacitor.
4. The integrated circuit of claim 3, further comprising a substrate and a thermal barrier on the substrate, the thin film dissipating element formed on the thermal barrier.
5. The integrated circuit of claim 2, wherein the circuit includes a voltage sense for sensing an output voltage of the power supply; a comparator for comparing the output voltage to a reference voltage; and a pulse generator for supplying pulses to the heater when the output voltage is less than the reference voltage.
6. The integrated circuit of claim 5, wherein the voltage sense includes a resistor ladder; and wherein the power supply further includes a rectifier for rectifying an output of the capacitor, the resistor ladder also forming a part of the rectifier.
7. The integrated circuit of claim 1, further comprising a circuit for balancing charge on the pyroelectric capacitor during cooling when power supply output voltage falls below a recovery voltage.

8. The integrated circuit of claim 7, wherein the circuit includes a diode connected between the capacitor and a recovery voltage terminal.
9. A regulated power supply comprising:
  - a pyroelectric capacitor;
  - a heat dissipating element in thermal communication with the pyroelectric capacitor; and
  - a feedback circuit for sending electrical pulses to the dissipating element and adjusting the pulses to regulate an output of the power supply.
10. The power supply of claim 9, wherein the heater includes a thin film dissipating element on a plate of the pyroelectric capacitor.
11. The power supply of claim 9, wherein the feedback circuit includes a voltage sense coupled to the power supply output; a comparator for comparing an output of the voltage sense to a reference value; and a pulse generator for supplying pulses to the heat dissipating element when the output voltage is less than the reference voltage.
12. The power supply of claim 11, wherein the voltage sense includes a resistor ladder; and wherein the power supply further includes a rectifier for rectifying an output of the capacitor, the resistor ladder also forming a part of the rectifier.
13. The power supply of claim 9, further comprising a circuit for recovering charge on the pyroelectric capacitor during cooling when output voltage falls below a recovery voltage.

14. The power supply of claim 13, wherein the circuit includes a diode connected between the capacitor and a recovery voltage terminal.

15. A regulated power supply comprising:  
a pyroelectric capacitor;  
means for sending heat pulses to the capacitor;  
means for comparing capacitor voltage to a reference voltage; and  
means for adjusting the heat pulses in response to the comparison.

16. A method of using a pyroelectric capacitor as a regulated power supply, the method comprising:  
sending heat pulses to the capacitor;  
comparing capacitor voltage to a reference voltage; and  
adjusting the heat pulses in response to the comparison.

17. The method of claim 16, wherein pulse width is adjusted.

18. The method of claim 16, wherein frequency of the heat pulses is adjusted.

19. The method of claim 16, wherein amplitude of the heat pulses is adjusted.